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### A NOTE ON THE NESTING BEHAVIOR AND PREY OF *AGENIOIDEUS* (*AGENIOIDEUS*) *HUMILIS* (CRESSON) (HYMENOPTERA, POMPILIDAE).

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*Agenioideus* (*Agenioideus*) *humilis* (Cresson) is one of our less commonly collected spider wasps, and relatively little has been published on its ethology. The few published prey records indicate that immature orb weaver spiders of the family Epeiridae constitute the only prey stored by *humilis*. Rau (Trans. Acad. Sci. St. Louis 24: 15, 1922) recorded it as having been collected at Creve Coeur Lake, Missouri, with its prey, a thoroughly paralyzed epeirid spider, *Epeira globosa* Keys.<sup>1</sup> Evans (Trans. Amer. Ent. Soc. 75: 197, 1950) in his revision of the Pompilini stated that one female from Niagara Falls, New York, was pinned with a juvenile epeirid, possibly a species of *Epeira*, and that another female from Sinai Bay, Long Island, New York bore a label stating that it had captured an epeirid, *Epeira pegenia* Walck. [recorded as *Aranea p.*].

Three published records mention various nesting sites, but nothing definite has been published on the actual location and construction of the cell, and two of the records carry the implication that the prey may occasionally just be stuffed into a convenient crevice in masonry. Hurd (Pan-Pacific Ent. 23: 132, 1947) reported rearing *humilis* from cocoons found in pulverized

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<sup>1</sup> Dr. B. J. Kaston advises me (*in litt.*) that—"What Rau called *Epeira globosa* Keyserling was probably what either Banks or Bryant at the MCZ determined for him; it is now usually called *Epeira pegenia* Walckenaer. Recently it was shown that the genus *Epeira* is untenable, so we will have to call it *Araneus pegenia*. Or else, according to the most recent 'splitting', *Neosconella p.* (W.)."

sandstone at the base of a cliff at Rock City, Mt. Diablo, California. Evans (U. S. Dept. Agr., Agr. Monogr. 2: 925, 1951) summarized the published and unpublished data at hand then as . . . "nests in sandy places, and around cliffs, walls, and buildings; . . ." Krombein (Trans. Amer. Ent. Soc. 78: 92, 1952) recorded a series from Westmoreland State Park, Virginia, as nesting in crevices in masonry foundations of a log cabin. I have since (1953) taken several specimens in a similar situation at Lost River State Park, West Virginia, and others while running or flying over a very small talus slope of rocky soil along one of the park trails.

The following observations establish that *humilis* occasionally (perhaps always?) constructs the cell for its prey in the manner of a typical ground nesting pompiline, though probably always in rather unusual media. On July 28, 1953, I was observing the nesting activities of several species of the sphecid wasp, *Spilomena*, which were nesting in the wooden walls of a disused lean-to cowshed attached to my garage in Arlington, Virginia. The *Spilomena* were entering burrows both outside and inside the shed, and it was while noting the activities of some of the specimens within the rather gloomy interior, that I saw a female *Agenioideus humilis* (72853 F) at 10 a.m., E. S. T., on the ground next to the exterior wall. A board had been removed from the wall near this area and enough light was admitted so that her actions could be observed. When I first saw her she was scratching with her forelegs and tugging with her mandibles at the sheet web of a spider which covered a crack half an inch wide at the base of the wall. I supposed at first that she was attempting to get at this spider to use it as her prey, but it was soon apparent that she was only removing the web to reach the debris which filled this crack between the concrete floor and the wooden foundation of the exterior wall. When she reached this debris, which appeared to consist largely of small grains of decomposed vegetable matter with intermixed particles of sand and soil, she began to dig with her forelegs a tunnel which penetrated the debris at an angle of 75° from the horizontal. Her paralyzed spider prey was lying venter up in the open on the wooden foundation six inches from the point where the burrow was being dug. The material in the crack was easily removed, and the wasp flung it out beneath and behind her body like a terrier digging. She emerged from the burrow occasionally to spread some of the excavated material farther from the entrance, but did not visit her prey. The cell was completed by 10:10.

After completion of the cell the wasp emerged, cleaned her antennae and legs, made an extremely brief reconnaissance trip on foot in the area around the burrow entrance, and then went to her spider. She grasped the spider at or near the base of the hind legs with the spider's abdomen beneath her, and walking backward dragged the spider toward the burrow. She left it once when halfway to the entrance and went in to examine the cell. Then she returned to the spider, again grasped it at or near the base of the hind legs and dragged it into the burrow. When the wasp reached the bottom of the burrow, she abandoned her grip on the spider's legs and, grasping it by the spinnerets, pulled it into the cell. The cell had been constructed beneath the concrete at an angle to the burrow, and about an inch below the surface. After the spider had been placed in the cell, only the apices of its legs were visible from above. The wasp remained with the spider about a minute, during which oviposition took place (as was determined later), and then came to the surface head first and scratched in some debris with her forelegs. Then, turning around, she pushed this down to the bottom of the burrow. Reversing her position again she proceeded to pound these particles down firmly with rapid blows with her abdomen. This process was repeated several times before I captured her after a plug a quarter of an inch thick had been constructed at the bottom of the burrow, and so was unable to ascertain the final details of the closure.

I dug up the spider and found that the wasp egg was 1.5 mm. long, and was securely attached to the right side of the venter of the abdomen anteriorly, parallel to the long axis of the spider's body. The spider could move its legs only very feebly at this time and also two days later, at which time it was preserved in alcohol because of failure of the wasp egg to hatch. I am indebted to B. J. Kaston for identification of this spider as a female epeirid, *Acacesia hamata* (Hentz).